

Western Area Power Administration Rates
Proposed Rates for Loveland Area Projects Transmission and Ancillary Services
American Wind Energy Association Comments
July 14, 2003 Public Information Forum

Parties joining AWEA on these comments are:

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The Western Interstate Energy Board (WIEB) and Doug Larson indicate that the Western Interstate Wind Evaluation Team (WIWET) is interested in achieving reasonable public policy in this proceeding and will be sharing information about the treatment of wind in the proceeding with WIWET members.

AWEA Comments

I. Introduction

1. Large-scale wind development is coming to Western's service territories. There are a number of factors driving large-scale wind development. These include very large wind resources in all of Western's states. Declining bus-bar costs for wind energy will continue to drive large-scale development, as Western's customers, and customers of other utilities in the region who want wind from Western's service areas, demand stable priced, environmentally sound energy. The demonstrated reliability of wind turbine technology continues to improve wind economics. Western's customers are increasingly demanding wind, as demonstrated by the efforts to aggregate loads for large scale wind purchases.

Federal, state, regional¹, and local public policies that encourage generation resource diversity, such as the Renewable Portfolio Standards in place in several states served by Western will also encourage large-scale wind development. Wind energy's superior environmental performance helps to hedge pollution risks and liabilities and helps to reduce exposure to long-term fossil-fuel climate change risks and liabilities. Finally, the demonstrated current and likely future risks of natural gas price and availability and of drought impacts on hydro generation, and their attendant large negative financial impacts, already being faced by Western and its customers, will continue to spur large scale wind development.

Given its hydro power marketing responsibilities and extensive transmission network, Western is in a unique situation to address wind integration issues. Western should be taking a leadership role.

2. The wind industry, utilities, renewable energy advocates, expert power engineering consultants, national laboratories, FERC, and other concerned parties have successfully resolved, and are currently addressing wind transmission planning, operations, and integration issues similar and related to those raised in the rate proposals in this proceeding.²

Some examples include:

- CAL-ISO adopted a wind forecasting procedure that FERC approved.³
- The California PUC and CEC are engaged in a process to determine the "least cost, best fit" for renewables under the state's RPS statute.⁴
- The Bonneville Power Administration eliminated imbalance penalties for intermittent renewables.⁵
- PJM and MAPP have determined methods for wind capacity value.⁶

¹ WAPA's IRP requirements which are found at www.wapa.gov/powerm/pmrip.htm call for identification and comparison of all energy supply options and "efforts to minimize adverse environmental impacts of new resource acquisitions."

² See, Parsons, B. and Milligan, M. et. al., "Grid Impacts of Wind Power: A Summary of Recent Studies in the United States" June, 2003. Presented at the European Wind Energy Conference, Madrid, Spain. The findings of the studies summarized in this paper indicate that relatively large-scale wind generation will have an impact on power system operation and costs, but these impacts and costs are relatively low at penetration rates that are expected over the next several years.

³ See Calif. Indep. System Op. Corp., 98 FERC ¶ 61,327 (Mar 27, 2002)

⁴ For a history of the project, see the April 23, 2003 report available at <http://cwec.ucdavis.edu/rpsintegration/>. A current report, "RPS Integration Analysis" was submitted by the RPS Integration Study Methods Group on June 30, 2003.

⁵ See, Transmission Generation Imbalance Service Rate Proposal, Administrators Draft Record of Decision, GI-02-A-01, Bonneville Power Administration, U.S. Department of Energy, June 28, 2002, and see, Order Confirming and Approving Bonneville Power Administration Rate Schedule on a Final Basis, 100 FERC ¶ 62,213 (September 30, 2002).

- The Colorado PUC determined that wind bid to Xcel Energy was the lowest cost generation resource, that high gas prices were likely, and that back up costs for wind were modest.⁷
- Xcel's current FERC rate filing projects that their Lamar wind project will save customers \$4.6 million annually, based on 2003 data.
- Xcel sponsored a study by the Utility Wind Interest Group that determined that wind back up costs were modest.⁸
- A study by Eric Hirst for the Bonneville Power Administration determined that back up costs for wind were likely to be modest.⁹
- AWEA wind development scenarios are being modeled in regional SSG-WI transmission planning. The results of this work will be posted on the SSG-WI web site under the planning work group.¹⁰
- Wind development scenarios have been modeled in the "Interior West Clean Energy Plan" being developed by the Land and Water Fund of the Rockies. Regional transmission needs are analyzed, net of efficiency and distributed generation.¹¹
- Wind development scenarios have been modeled in MISO planning.¹²

⁶ Recommendations for Capacity Credit Factor Calculations for Wind Turbines, Intermittent Capacity Working Group, April 10, 2003, PJM, available at <http://www.pjm.com/committees/raa-rc/downloads/20030410-recommendations-for-capacity-credit-calculations-for-wind.pdf>.

MAPPs method is in Section 3.4.7.2.7 of the MAPP Reliability Handbook (<http://wwwmapp.org/content/reliabilityhandbook.shtml>).

⁷ Lehr, R. L.; Nielsen, J.; Andrews, S.; Milligan, M. (2001). Colorado Public Utility Commission's Xcel Wind Decision. 12 pp.; NREL Report No. CP-500-30551. It is posted on the National Renewable Energy Laboratory web site (www.nrel.gov) at: <http://www.nrel.gov/docs/fy01osti/30551.pdf>

⁸ See "UWIG Operating Impacts Study" at: www.uwig.org.

⁹ See "Integrating Wind Energy With the BPA Power System: Preliminary Study," September 2002 at www.ehirst.com

¹⁰ See, <http://www.ssg-wi.com>

¹¹ While the modeling of the wind development plan is complete, a report on the IWCEP is currently under development. A Renewable Energy Atlas of the West has been completed. See www.energyatlas.org.

¹² MISO expansion planning page (lists reports and presentations)
http://www.midwestiso.org/plan_inter/expansion.shtml

Link to copy of MISO Board-approved MTEP
http://www.midwestiso.org/plan_inter/documents/expansion_planning/MTEP%202002-2007%20Board%20Approved%20061903.pdf

Link to MTEP Executive Summary only
http://www.midwestiso.org/plan_inter/documents/expansion_planning/MTEP%202002-2007%20Board%20Approved%20061903%20Exec%20Sum.pdf

- PacifiCorp's recently completed Integrated Resource Plan adds 1400 MW of new renewable energy and determines costs for integrating wind are modest.¹³

Tentative conclusions from this body of work are that scenarios have been developed that detail large scale wind development in Western's service areas. This work shows that significant regional transmission planning work is underway to accommodate large scale wind development. Imbalance penalties, where carefully considered, are not appropriate for intermittent resources like wind. Finally, every study of ancillary service costs shows that these are modest for near term wind development.

3. Rate issues in Western's proceeding are part of a number of transmission planning, policy, and operational issues faced by wind:

- Interconnection and Queues. Wind generating plants can be built and put in service in months, while interconnection studies and transmission queue processes can take years.
- Access to long-term non-firm transmission service. OASIS shows firm transmission service is often fully subscribed by incumbent firms. Data from SSG-WI shows many regional transmission congestion points in WECC to be physically congested only a small portion of the time,¹⁴ yet non-firm transmission service under Order 888 compliant tariffs is only available for periods of less than one year. As wind is able to be dispatched off the system, investigation of use of physically available transmission on a long-term, non-firm basis might show how wind could make use of existing transmission in non-congested times.
- Scheduling and forecasting. Requirements to schedule generation a day or more ahead of delivery challenges wind in the absence of agreement on wind forecasting methods and implementation and can unnecessarily raise ancillary service costs for wind.
- Imbalance penalties. Arbitrary, non-cost based penalties for not meeting schedules by intermittent generators (who do not have the ability to "game" the scheduling system) in the absence of market based real time settlements for imbalances can and should be eliminated for wind without negative impacts on grid operations or costs.

¹³ See <http://www.pacificorp.com/Navigation/Navigation23807.html> to review the IRP and to review the Requests for Proposals consistent with Chapter 9 of the IRP, see <http://www.pacificorp.com/Article/Article26302.html>. A presentation on the PacifiCorp operating impacts study for wind by Ken Dragoon will be posted "soon" on <http://www.uwig.org/uwig-AnnualMeeting03-co.html>.

¹⁴ http://www.ssg-wi.com/documents/226-2002_Report___final_pdf.pdf

- Ancillary services. Costs based on methods that do not adequately comprehend the system impacts of adding wind can provide an absolute bar to wind development.
- Generator modeling for stability analysis. Wind farm and wind technology design options can vary depending on the circumstances. Engineering interconnection software should have the correct wind options in data libraries. An iterative process between wind project developers and grid operators is needed, to determine good utility practices for interconnecting wind. ERCOT's work in this area provides an example of how these issues are being addressed.¹⁵
- Cost allocations for transmission upgrades and additions. The allocations for upgrades and additions must take into account both costs imposed by new generators and the system benefits of investments.
- Wind integration with hydro electric resources. There may be opportunities to add flexibility and value to the hydro system by integrating wind.

Our coalition looks forward to working on these issues with Western and other stakeholders. We do not suggest that all these issues can be solved in the context of this rate case. However, we want to work constructively in the short term with Western to address scheduling, imbalance penalties and ancillary service costs and rates and the potential for long term access to non-firm transmission service. Our review of the Western proposal suggests that the level of ancillary service rates in the notice is too high by an order of magnitude. There needs to be much more dialogue to sort this out.

II. Comments on Western's rate proposals

1. Our coalition supports elimination of imbalance penalties for intermittent renewables based on the precedent set by the Bonneville Power Administration. In eliminating their imbalance penalties for non-dispatchable renewables, the BPA Record of Decision states that "(w)ind generators, unlike other generators, are uniquely situated, cannot respond to the intent of the 100-mill penalty rate, and should be exempt from the 100-mill penalty."¹⁶

2. Western's notice of proposed rate for energy imbalance service¹⁷ states that "(n)o significant changes are proposed." While wind coalition supports the logic of reduction of the minimum deviation and size of penalties, as Western proposes, the wind coalition supports the elimination of imbalance penalties for intermittent

¹⁵ See, <http://www.electrotek.com/pressrel/index.htm>

¹⁶ Transmission Generation Imbalance Service Rate Proposal, Administrator's Draft Record Of Decision, Gi-02-A-01, Bonneville Power Administration, U.S. Department Of Energy, June 28, 2002, page 19.

¹⁷ Federal Register/Vol.68, No. 114/Friday, June 13, 2003/Notices, column 1, page 35400.

renewable resources, for the reasons supporting their elimination found in the BPA and FERC decisions on imbalance penalties.

3. In principle, the Wind Coalition supports Western's adoption of ancillary service costs that reflect a control area and system approach consistent with good power systems engineering practices. Elements of this approach should include the following considerations:

- Rates should reflect costs, to send correct economic signals.
- The method of analysis should work equally well and fairly for both small and large amounts of wind.
- Data relied on in the analysis of costs should reflect diversity of wind sites in Western's control areas.
- Analysis should consider both costs and benefits of wind variability.
- The outcome should be fair to all, not a bar to wind.
- Wind should not be singled out for this treatment.
- Western should recognize that wind output is not completely random and that it can be forecast with increasing accuracy over both hourly and day-ahead time periods. Predictability can reduce integration costs.¹⁸

Western should engage with stakeholders in an examination of the costs and benefits of forecasting wind, and make progress toward implementing forecasting systems that maximize benefits and minimize costs.

- The stochastic nature of grid systems must be taken into account. Electric grids routinely handle varying, uncertain demands and unexpected transmission and generation outages.
- Actual wind farm power output characteristics, including multiple-generator smoothing both within and among wind farm sites, as well as improved wind generator and wind farm interface capabilities should be considered.
- Large-scale geographic diversity, which smooths aggregate wind power output, should be considered.
- When wind is introduced into the system, Western should recognize the change in regulation requirements that are imposed by the new wind plants. These regulation requirements impact the level of existing regulation. There are times that wind may not have an impact, times that wind could increase regulation, and times that wind might reduce required regulation.

¹⁸ For example, 24-48 hour ahead hourly forecasts based on meteorological models can generally predict hourly output of a wind plant within 10-15% of the overall capacity of the plant. The evidence indicates that the forecast error increases only slightly for longer forecast periods, up to about 3 days ahead. For example, if these forecasts predicted that the output of a 100 MW wind farm for a given hour over was 60 MW, a utility could be .8 (80%) confident that the actual output of the wind facility would fall within the range of 50-70 MW. Testimony of Michael Milligan, Colorado PUC Docket No. 99A-549E

- Power system operators do not balance individual loads with individual generation resources. The natural statistical diversity in load allows the operator to focus on the balance of the entire system where aggregate resources serve aggregate loads, with additional resources carried for errors and for reserves against various contingencies. This concept suggests additional careful scrutiny of Western's assertion that "An analysis done by Western to measure the variation of intermittent renewable resources within WACM indicates that 27 percent of the nameplate capacity of those units is required for regulation." If this requires 27% standby generation for wind, an adequate basis for the requirement appears to be lacking.
- Generators respond to changing load conditions in different time frames. Automatic Generation Control (AGC) handles minute-to-minute load fluctuations, "regulating" generators to match loads. "Load following" covers time frames from about 10 minutes to several hours ahead, using economic dispatch decisions to respond to load trends. The "unit commitment" time scale, from hours to several days ahead, allows generators whose run times determine their economics to be ready to meet loads reliably. Wind power needs careful consideration in each of these different time frames.

4. The Wind parties stand ready to engage with Western in constructive dialogue toward resolution of the issues that Western and wind face as large-scale wind development spreads in Western's service territory. We propose an initial workshop co-sponsored by Western, NREL, ORNL, and others. The agenda should allow participants to share data and methods developed elsewhere, to discuss preliminary findings already in hand, and to develop the issues and agendas for working groups to resolve the issues in this rate proceeding and begin the process of addressing the broader issues raised in these comments.

III. Summary

AWEA and joining parties appreciate Western's consideration of these public information meeting comments. Wind is coming to Western's service areas. A great deal has been accomplished in other forums that relates to the rate issues in this proceeding. This progress should be carefully investigated. The dialogue on Western's imbalance service rate proposal should be broadened so alternative data and methods can be considered. Imbalance penalties should be eliminated for intermittent renewable energy generators. Western should invite a partnership with interested parties to establish a work agenda to address and resolve issues.

Respectfully Submitted

Ronald L. Lehr 7/14/03

Ronald L. Lehr

Date

Western Representative

American Wind Energy Association